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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,098	12/08/2004	Kia Silverbrook	MJ87US	5074

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SILVERBROOK RESEARCH PTY LTD  
393 DARLING STREET  
BALMAIN, NSW 2041  
AUSTRALIA

EXAMINER
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DO, AN H

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 06/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/510,098

**Applicant(s)**

SILVERBROOK, KIA

**Examiner**

An H. Do

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/5/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 05 October 2004 was filed and is being considered by the examiner.

### ***Double Patenting***

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to

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be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-9 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-7 of U.S. Patent No. 6,652,074.

Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

Claims 1-7 of U.S. Patent No. 6,652,074 disclose the following claimed features:

Regarding claim 1, an ink jet printhead chip (claim 1, line 1) that comprises a substrate (claim 1, line 2); drive circuitry positioned in the substrate (claim 1, line 3); and a plurality of nozzle arrangements positioned on the substrate (claim 1, lines 4-5), each nozzle arrangement comprising nozzle chamber walls and a roof wall that define a nozzle chamber and an ink ejection port in the roof wall in fluid communication with the nozzle chamber (claim 1, lines 6-9); an ink pusher that is operatively positioned with respect to the nozzle chamber and is displaceable through a range of between 1 micron and 5 microns to eject ink from the ink ejection port (claim 1, lines 10-13); and an actuator that is connected to the drive circuitry and the ink pusher to displace the ink pusher on receipt of an electrical signal from the drive circuitry (claim 1, lines 14-16).

Regarding claim 2, in which the ink pusher is displaceable through a range of between 1.5 microns and 3 microns (claim 2).

Regarding claim 3, which is the product of a MEMS fabrication technique (claim 3).

Regarding claim 4, in which each ink pusher is in the form of a paddle member that is positioned in the nozzle chamber to span the nozzle chamber (claim 4).

Regarding claim 5, in which each actuator includes an actuator arm that is fast with the substrate at one end and attached to the paddle member at an opposed end, the actuator arm incorporating a thermal bend mechanism that is configured to deflect when heated by said electrical signal from the drive circuitry to displace the paddle member (claim 1, lines 16-22).

Regarding claim 6, in which each thermal bend mechanism includes a portion of the actuator arm that is of a material having a coefficient of thermal expansion which is such that the material is capable of thermal expansion to an extent sufficient to perform work and an electrical heating circuit positioned on said portion of the actuator arm to heat a side of said portion so that said portion experiences differential thermal expansion resulting in deflection of the actuator arm and the displacement of the paddle member (claim 5).

Regarding claim 7, in which the roof wall defines the ink pusher (claim 6).

Regarding claim 8, in which each actuator includes an actuator arm that is fast with the substrate at one end and attached to the roof wall at an opposed end, the actuator arm incorporating a thermal bend mechanism that is configured to deflect when heated by said electrical signal from the drive circuitry to displace the roof wall towards the substrate (claim 1, lines 16-22).

Regarding claim 9, in which the actuator arm is of a conductive material having a coefficient of thermal expansion which is such that the material is capable of thermal expansion to an extent sufficient to perform work, a portion of the actuator arm defining a heating circuit which is configured to expand thermally on receipt of said electrical signal, said portion of the actuator arm being positioned so that the actuator arm is deflected towards the substrate upon such deflection (claim 7).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have claims 1-9 of the instant application anticipated by claims 1-7 of Patent '074 in order to obtain more variety of claimed structures.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 and 3-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Sharma (US 6,352,337).

Sharma discloses in Figure 1 the following claimed features:

Regarding claim 1, an ink jet printhead chip (10) that comprises a substrate (11); drive circuitry (24) positioned in the substrate (11); and a plurality of nozzle arrangements positioned on the substrate (11), each nozzle arrangement comprising

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nozzle chamber walls (15) and a roof wall (16) that define a nozzle chamber (14) and an ink ejection port (top opening) in the roof wall (16) in fluid communication with the nozzle chamber (14); an ink pusher (20) that is operatively positioned with respect to the nozzle chamber (14) and is displaceable through a range of between 1 micron and 5 microns to eject ink from the ink ejection port (column 3, lines 41-47); and an actuator (22) that is connected to the drive circuitry and the ink pusher (20) to displace the ink pusher on receipt of an electrical signal from the drive circuitry (Figure 1).

Regarding claim 3, which is the product of a MEMS fabrication technique (column 3, lines 17-32).

Regarding claim 4, in which each ink pusher (20) is in the form of a paddle member (19) that is positioned in the nozzle chamber to span the nozzle chamber (Figure 1).

Regarding claim 5, in which each actuator includes an actuator arm (20) that is fast with the substrate at one end (left end of element 20) and attached to the paddle member (19) at an opposed end (right end of element 20), the actuator arm (20) incorporating a thermal bend mechanism that is configured to deflect when heated by said electrical signal from the drive circuitry to displace the paddle member (column 1, lines 48-59).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sharma (US 6,352,337) in view of Sharma et al (US 6,276,782).

Sharma discloses the claimed invention except for reciting each thermal bend mechanism includes a portion of the actuator arm that is of a material having a coefficient of thermal expansion which is such that the material is capable of thermal expansion to an extent sufficient to perform work and an electrical heating circuit positioned on said portion of the actuator arm to heat a side of said portion so that said portion experiences differential thermal expansion resulting in deflection of the actuator arm and the displacement of the paddle member.

Sharma et al teach in Figure 1 each thermal bend mechanism includes a portion of the actuator arm that is of a material having a coefficient of thermal expansion which is such that the material is capable of thermal expansion to an extent sufficient to perform work and an electrical heating circuit positioned on said portion of the actuator arm to heat a side of said portion so that said portion experiences differential thermal expansion resulting in deflection of the actuator arm and the displacement of the paddle member (column 3, lines 56-59).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a portion of the actuator arm that is of a material having a coefficient of thermal expansion resulting in deflection of the actuator arm and the displacement of the paddle member, as taught by Sharma et al into Sharma, for the purpose of thermally actuating the paddle to eject ink.



***Allowable Subject Matter***

8. Claims 2 and 7-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The primary reason for the allowance of claim 2 is the inclusion of the limitation of an inkjet printhead chip that includes an ink pusher displaceable through a range of between 1.5 microns and 3 microns. It is this limitation found in the claims, as it is claimed in the combination of, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 7-9 is the inclusion of the limitation of an inkjet printhead chip that a roof wall defining the ink pusher. It is this limitation found in the claims, as it is claimed in the combination of, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Silverbrook (US 6,217,153) discloses the inkjet printhead having a plurality of nozzle arrangements positioned on the substrate, a plurality of actuators and a plurality of ink pushers. Silverbrook (US 6,338,548), common inventor and assignee, discloses the inkjet printhead having a plurality of actuators associated with a plurality of arms and levers for ejecting ink.


***Contact Information***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to An H. Do whose telephone number is 571-272-2143. The examiner can normally be reached on Monday-Friday (Flexible).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on 571-272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AD  
June 8, 2006

  
An H. Do  
Examiner  
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